



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,692	05/24/2004	Ebenezer E. Eshun	BUR920030190US1	3691
24241	7590	12/12/2005	EXAMINER	
IBM MICROELECTRONICS INTELLECTUAL PROPERTY LAW 1000 RIVER STREET 972 E ESSEX JUNCTION, VT 05452			LANDAU, MATTHEW C	
		ART UNIT		PAPER NUMBER
		2815		

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

EX

Office Action Summary	Application No.	Applicant(s)	
	10/709,692	ESHUN, EBENEZER E.	
	Examiner	Art Unit	
	Matthew Landau	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 26 September 2005.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
 4a) Of the above claim(s) 10-17 is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-9 and 18-20 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 24 May 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, claims 1-9 and 18-20, in the reply filed on September 26, 2005 is acknowledged.

Claims 10-17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaneoya et al. (US Pat. 3,601,889, hereinafter Kaneoya).

Regarding claim 1, Figure 1 of Kaneoya discloses a thin-film resistor comprising a conductor layer 2 (Ni-Cr) (col. 2, lines 10-13) formed on a surface, said conductor layer comprising end portions tapered at an angle less than about 90 degrees with respect to the surface to provide contact regions for coupling to said thin-film transistor.

Regarding claim 9, Figure 1 of Kaneoya discloses contacts 3/4 abutting said contact regions to provide for electrical coupling to said thin-film resistor.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Komeda (US Pat. 6,144,287).

Regarding claims 1-3, Figures 2 and 9 of Komeda disclose a thin-film resistor comprising a conductor layer 4 (silver-palladium) (col. 3, lines 63-65) on a surface, said conductor layer comprising end portions (4a and 4b) tapered at an angle of 45 degrees (see abstract) with respect to the surface to provide contact regions for coupling to said thin-film resistor. As shown in Figure 2, an overcoat layer 5 is in contact with the tapered portions. Therefore, those portions can be considered “contact regions”, wherein layer 5 is coupled to the resistor. Note the claim does not state the contact regions must be for electrical contact.

Claims 1, 4, 6, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Shiiki et al. (US PGPub 2002/0020879, hereinafter Shiiki).

Regarding claims 1 and 4, Figures 5A and 5B of Shiiki disclose a thin-film resistor comprising a conductor layer 30 (TaN) (paragraph [0064]) formed on a surface, said conductor layer comprising end portions tapered at an angle less than about 90 degrees with respect to the surface to provide contact regions for coupling to said thin-film resistor. Note that Shiiki discloses layers 30 and 18 are formed of the same material and have the same thickness (paragraph [0077]).

Regarding claim 6, Figures 5A and 5B of Shiiki disclose a dielectric layer 31 formed on said conductor layer 30.

Regarding claim 9, Figure 5B discloses contacts 33 abutting said contact regions to provide for electrical coupling to said thin-film resistor.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3, 5, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiiki.

Regarding claims 2, 3, 18, and 19, Figures 5A and 5B of Shiiki disclose a semiconductor structure comprising: a substrate 12 comprising a plurality of interconnects 33 formed on an upper surface of an inter-metal dielectric layer 29; and a thin-film resistor comprising a conductor layer 30 (TaN) (paragraph [0064]) formed on the upper surface of said inter-metal dielectric layer and adjacent to a first of said plurality of interconnects, said conductor layer comprising end portions tapered at an angle with respect to the upper surface to provide contact regions for coupling to said thin-film transistor. Shiiki does not explicitly disclose the angle is between about 40 degree and about 50 degrees. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Shiiki by using an angle within the claimed range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. The ordinary artisan would have been motivated to modify Shiiki in the manner described above for the purpose of ensuring

adequate contact area for the electrodes. Note that Applicant has not shown unexpected results to established criticality for the claimed range.

Regarding claim 5, Shiiki does not explicitly disclose the conductor layer has a thickness of from about 45 nm to about 55 nm. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Shiiki by using a thickness within the claimed range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Note that Applicant has not shown unexpected results to established criticality for the claimed range.

Regarding claim 20, Shiiki does not explicitly disclose said plurality of interconnects 33 comprise aluminum or aluminum alloy. Figure 1A of Shiiki discloses another embodiment of the invention in which interconnects 1 are made of aluminum alloy (paragraph [0054]). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Figures 5A and 5B of Shiiki by using aluminum alloy for the purpose of well-known material with a low resistivity.

Claims 6, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneoya in view of Shiiki.

Regarding claims 6 and 7, the difference between Kaneoya and the claimed invention is a SiN layer formed on the conductor layer. Figures 4A-4D of Shiiki disclose a thin-film resistor comprising a conductor layer 24 and a silicon nitride layer 25 (paragraph [0073]) formed on said conductor layer. In view of such teaching, it would have been obvious to the ordinary artisan at

the time the invention was made to modify the invention of Kaneoya by including a silicon nitride layer on the conductor layer for the purpose of protecting the conductor layer during processing (i.e., etching of contacts) (paragraph [0072] of Shiiki).

Regarding claim 8, a further difference between Kaneoya and the claimed invention is the dielectric layer has a thickness of from about 65nm to about 75nm. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Kaneoya by using a thickness within the claimed range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Note that Applicant has not shown unexpected results to established criticality for the claimed range.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (571) 272-1731.

The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on (571) 272-2298. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should any questions arise regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Matthew C. Landau

December 7, 2005